PMCD
Program Manager for Chemical Demilitarization

information

Mobile Munitions Assessment System Phase II

The potential presence of non-stockpile chemical warfare materiel (CWM) exists at more than 200 sites in the United States and its territories. Part of the mission of the Non-Stockpile Chemical Materiel Project (NSCMP) is to safely recover, store, and dispose of this materiel. The first step in the ultimate disposal process is to accurately assess the condition of suspected CWM.

In an effort to increase their assessment capabilities and to further enhance public and worker safety, the NSCMP has developed the Mobile Munitions Assessment System Phase II (MMAS II). This system is completely housed inside of a 35-foot, diesel-powered motor home. The motor home serves as a command and control platform and is capable of transporting and supporting various non-destructive evaluation subsystems and support equipment. The system can be transported over land via roadways or by air on a military cargo plane.

The MMAS II is equipped with non-intrusive characterization and assessment equipment. This equipment includes portable x-ray devices; a Portable Isotopic Neutron Spectroscopy (PINS) system; air and weather monitoring systems, and a variety of communications equipment. The major addition to the MMAS II system is the inclusion of a Secondary Ion Mass Spectroscopy (SIMS) system. The SIMS system is used to detect the presence of chemical agents or chemicals on the munition surface or in the surrounding area (e.g., in soil and packing material). The SIMS system works by bombarding a solid sample with an energetic ion beam and monitoring atoms that are ejected. These atoms are then analyzed by a mass spectrometer to determine the presence of chemical agent.

The MMAS II also has an advanced real-time x-ray system, and an enhanced air monitoring system. The MMAS II can also be equipped with other advanced assessment equipment as new systems are developed or deemed necessary.

The MMAS II will be fielded at recovery and storage locations throughout the country where suspected recovered CWM is located. The system provides the capability to identify the munitions type; evaluate the condition of the CWM; evaluate the environmental conditions in the vicinity of the CWM; determine if fuzes, bursters, or safety and arming devices are in place; and identify the chemical fill. The system also provides all appropriate data (e.g., meteorological data) necessary for assessing the risk associated with handling, transporting, and disposing of CWM. The data developed by the MMAS II allow Army personnel to determine the appropriate methods and safeguards necessary to transport, store, and dispose of agent-filled munitions in a safe and environmentally acceptable manner.

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For more information, contact the Public Outreach and Information Office of the Program Manager for Chemical Demilitarization at 1. 800.488.0648

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Secondary Ion Mass Spectroscopy (SIMS)

The SIMS system is used to detect the presence of chemical agent on the munition surface or in the surrounding area (e.g., in soil and packing material). The SIMS system works by bombarding a solid sample with an energetic ion beam and monitoring atoms that are ejected. These atoms are analyzed by a mass spectrometer to determine the presence of chemical agent.

Laser Acoustics Characterization (LAC)

The LAC is an acoustic, non-contacting system that uses a broad band, also known as white noise, to determine the munitions fill. This sensor uses a low sound frequency to excite the object. The infrared laser then measures the response of the object (in surface vibrations).

Andrex

The Andrex instrument is a field-portable, high-resolution digital radiography and computed tomography (DCRT) system used to x-ray munitions. The Andrex Smart 300 has the film processing capability to develop either a Polaroid-type radiographic film or a standard negative x-ray-type film. An x-ray scanner is wall mounted in the motor home for viewing developed x-ray film, as well as storing the radiography image in the Mobile Munitions Assessment System (MMAS) computer.

Field Ion Spectrometry (FIS)

FIS is an advanced technology that can detect and identify very small amounts of chemical warfare agent vapors during chemical demilitarization activities. FIS, like its predecessor — ion mobility spectrometry (IMS) system, separates analyte ions by their velocities in an electric field at ambient pressure, but with a much greater degree of sensitivity than the conventional IMS.

Ion Mobility Spectrometry (IMS)

IMS is a portable detector that uses gas phases, atmospheric pressures, and an ionization technique to separate analyte ions by their velocities in an electrical field at ambient pressure. The IMS instrument has the capability to identify multiple chemical warfare agents and measure a very high degree of sensitivity.

Portable Isotopic Neutron Spectroscopy (PINS)

PINS is a non-intrusive instrument that analyzes recovered munitions without opening or disturbing them. The PINS system uses three components to identify elements inside munitions: a neutron source, a gamma ray detector, and a multi-channel analyzer.

OSHA Level A Suits

Occupational Safety and Health Administration (OSHA) requires workers to use different levels of personal protective equipment for various types of work. Level A equipment requires workers to use the maximum amount of protection for skin, eyes, and the respiratory tract. A Level A suit is required for military munitions assessments. It is a totally-encapsulating chemical-protective suit with a self-contained breathing apparatus.

M-90

The M-90 is a chemical warfare agent detector with gross-level air monitoring systems. Gross-level air monitoring systems use the ion mobility spectroscopy technique, which generates a spectrum of fragment ions, based on ion migration time. The M-90 is a tool that can be monitored by the operators working at a remediation site through a real time display.